

safeguarding the public. Stories to that effect appear in the media every day. Pesticides or additives sworn to be absolutely benign one day are banned as hazardous the next. Scientists upon whose knowledge we depend to make those decisions disagree vehemently among themselves over the safety of agricultural practices vis-à-vis the health of the consumer, the pollution of our water supplies, and the long-term productive capacity of the soil. But the consumer is no fool. The disturbing evidence can no longer be ignored. Something is amiss, and whether there is "absolute" scientific proof or not, a groundswell has begun. The emperor has no clothes, and the public, by doubting the adequacy of the regulatory agencies, has begun to make independent decisions to seek safer food.

We may seem to have wandered off the subject of marketing strategy, but not in practical terms. Quality is the lynchpin of a small-scale grower's business. Once consumers realize that certain producers *care*, that they are *sincere* and that their word and their produce are *dependable*, they will patronize them faithfully. I ran a market garden in Maine from 1968 to 1978 in a very unlikely location. The farm was 6 miles from a numbered highway (and the last 3 miles were dirt road). Marketing problems? I had none. Our produce set the quality standard, and we always had more demand than we could meet. Once a reputation for "real" food is established, there is no better advertising or marketing program. The market, as they say, will take care of itself.

The local organic grower has an additional marketing advantage which should be exploited. As the organic food industry expands, large-scale marketers, whose only interest is profit, will soon move in. Despite the existence of a national certification program, deceptive practices will increase, and suspicions about whether the food is truly organic will become commonplace. Consumers will soon realize (and I for one will certainly encourage them to do so) that the best way to be assured of food quality is, in the words of the old quotation, "to know the first name of the grower."

## PLANNING AND OBSERVATION

WHEN I BEGAN FARMING FULL-TIME ON MY OWN LAND IN MAINE, I WAS extremely fortunate to have as friends and neighbors Scott and Helen Nearing. The Nearings taught me a wide range of economic survival skills, but the most important were *planning* and *observation*. The Nearings demonstrated those two valuable skills at their best.

They were careful planners and organizers of the work to be done and the crops to be grown, and always sought out the most efficient way to accomplish any task at hand. They were without a doubt the most practically organized country people I have ever met. In fact, I remember marveling that Scott was the one nonagenarian I knew with plans for the future farm project he would be working on ten years hence. Many of Helen and Scott's ideas and experiences as small farmers are described in their book, *Living the Good Life* (Harborside, Maine: Social Science Institute, 1954; reprinted, New York: Schocken, 1970).

### *Planning on Paper*

I soon learned to plan ahead much more efficiently than I ever had—to set out the whole year's work on paper during the winter months and thus have a good grasp well in advance of what resources I would need, where they would come from, how I would acquire them, and how much time I could allot to each task. I organized a notebook into sections for each vegetable crop, for every year in the different rotations I was trying out, for fertilization records on each field, and so forth. There is no way to match the value of organizing and planning beforehand.

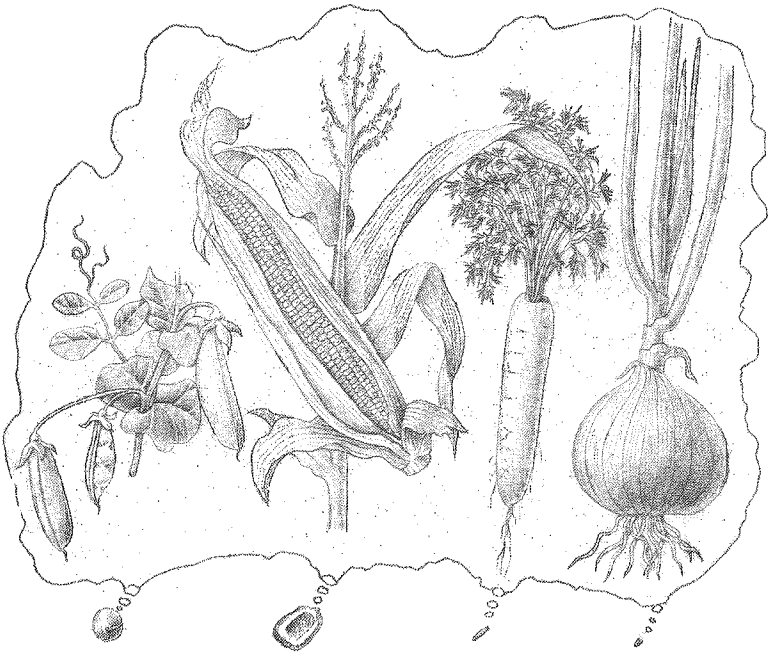
The Nearings were masters of observation. They meticulously recorded all the bits and pieces of data gleaned out of day-to-day farm activities—from which variety of lettuce wintered over best to what combination of ingredients made the most effective compost for peas. Some of their observations came from intentional comparative trials, but the majority came by chance—from keeping their eyes open and training themselves to notice subtle differences, where less perceptive observers would pass by unawares. In short, they never stopped learning and were wise enough to record what they noticed so it would be of use to

Taking a cue from the Nearings, the first step, therefore, is to plan out your operation in detail. Let's go through this process step by step to figure out which crops to grow, in what quantities, and how to set it all up.

What to Grow

Depending on the market and the climate in your area, the possibility exists to grow anywhere from one to 70 or so reasonably common vegetable crops. Imaginative growers are rediscovering old crops every day. John Evelyn in his 1699 essay *Acetaria: A Discourse of Sallets* listed 77 vegetable crops, and those were just salad ingredients. The 48 vegetables I consider the most promising are listed below and are divided into two categories, major and minor.

Major		Minor
Asparagus	Radish	Arugula
Bean	Rutabaga	Celeriac
Beet	(Swede turnip)	Chinese Cabbage
Broccoli	Spinach	Collards
Brussels sprouts	Squash, summer	Dandelion
Cabbage	Squash, winter	Eggplant
Carrot	Tomato	Endive
Cauliflower		Escarole
Celery		Fennel
Chard		Kohlrabi
Corn		Leek
Cucumber		Mâche
Garlic		Okra
Kale		Radicchio
Lettuce		Salsify
Melon		Scorzonera
Onion, bulb		Shallot
Onion, scallion		Turnip
Parsley		
Parsnip		
Peas		
Pepper		
Potato		
Pumpkin		

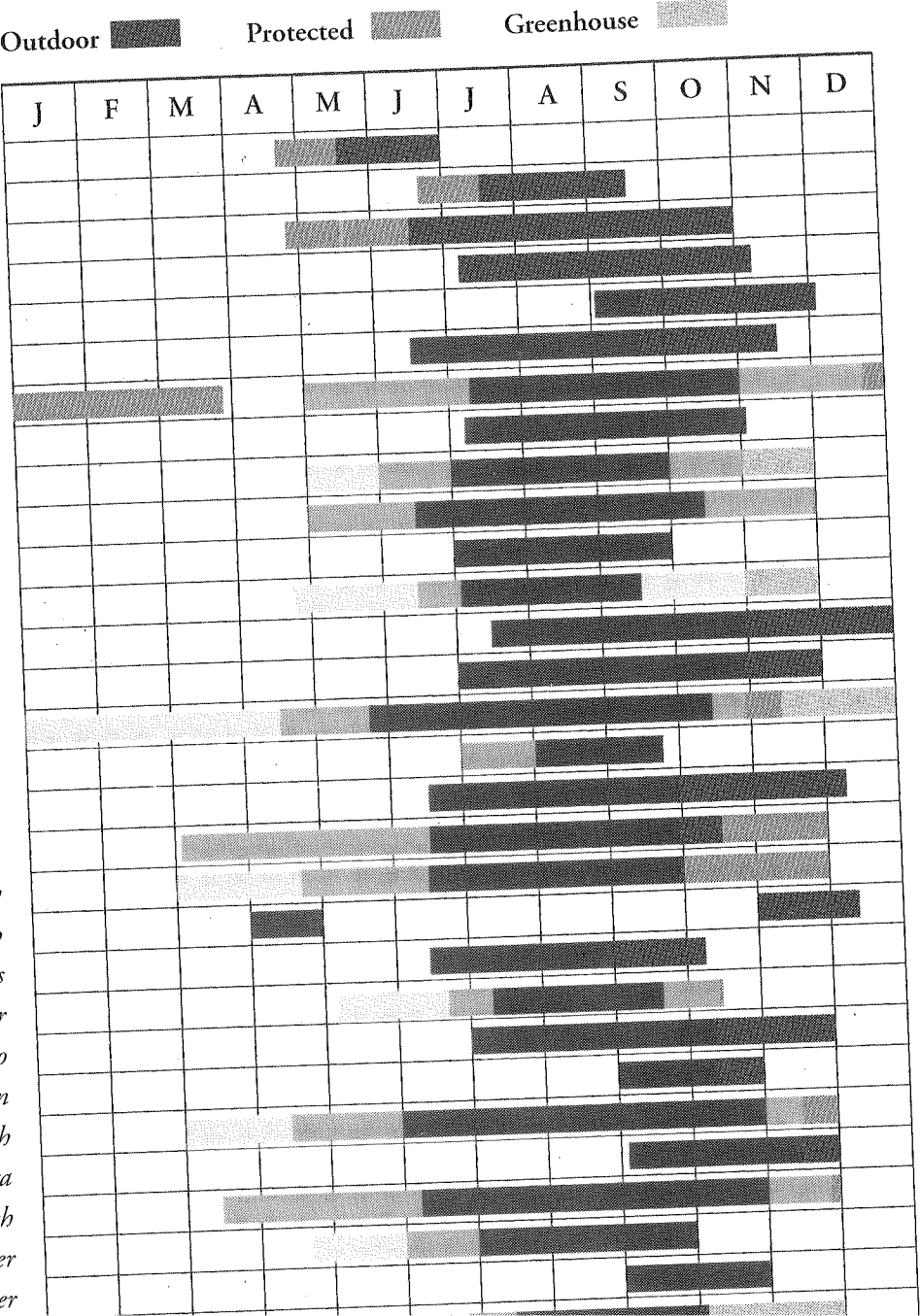


One way to begin deciding which vegetables to grow is to write down in chart form any information that will help organize your planning. For example, I might begin by compiling a chart of the months when different vegetables could be available for sale if they were grown in my area. That chart should include the potential for extended availability of these crops if the growing season is supplemented by the protection of walk-in tunnels, the greater protection of a heated greenhouse, or out-of-season sales from a storage building. (For a discussion of the whole range of season extension possibilities, see Chapters 21, 22, and 23.)

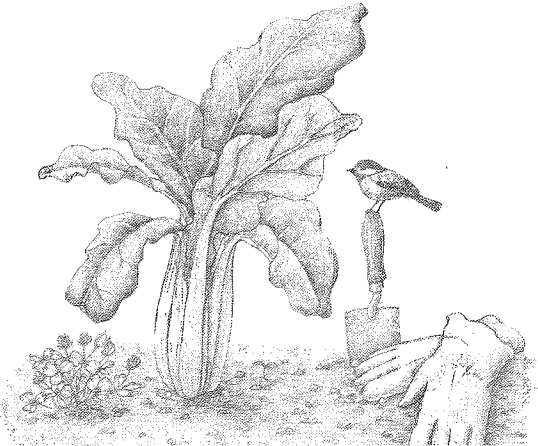
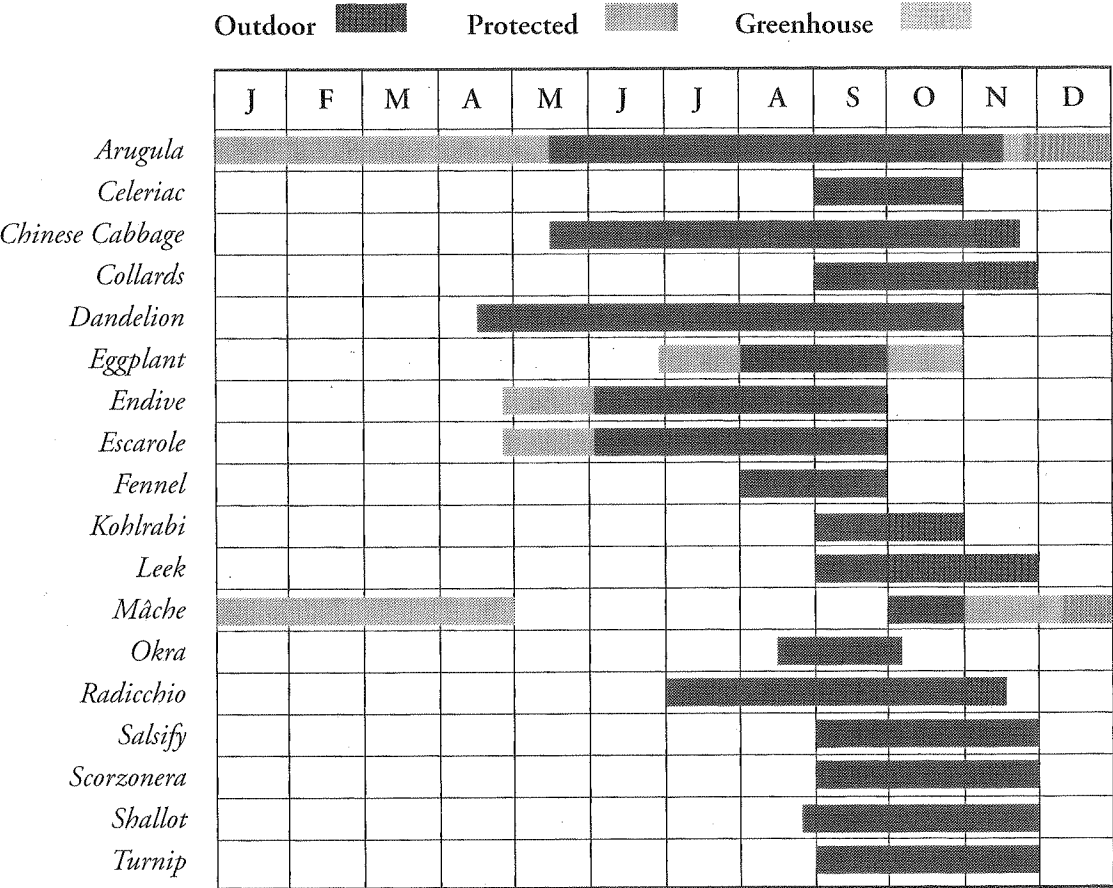
A chart of the potential availability of crops for sale in my area, New England, might look like the charts on pages 36 and 37.

Then, depending on whether I wanted to grow just seasonally or for an extended market, I would have an idea which crops could be available and when. The advantage of compiling this kind of information is that it stimulates thinking. It might suggest a specific course of action, such as a degree of specialization, perhaps. A wide variety of crops can be made available year-round. In many markets year-round production can help keep customers or acquire restaurant contracts. A look at the chart shows that many salad crops are capable of year-round production (see Chapter 23). A chart for specialization in salad

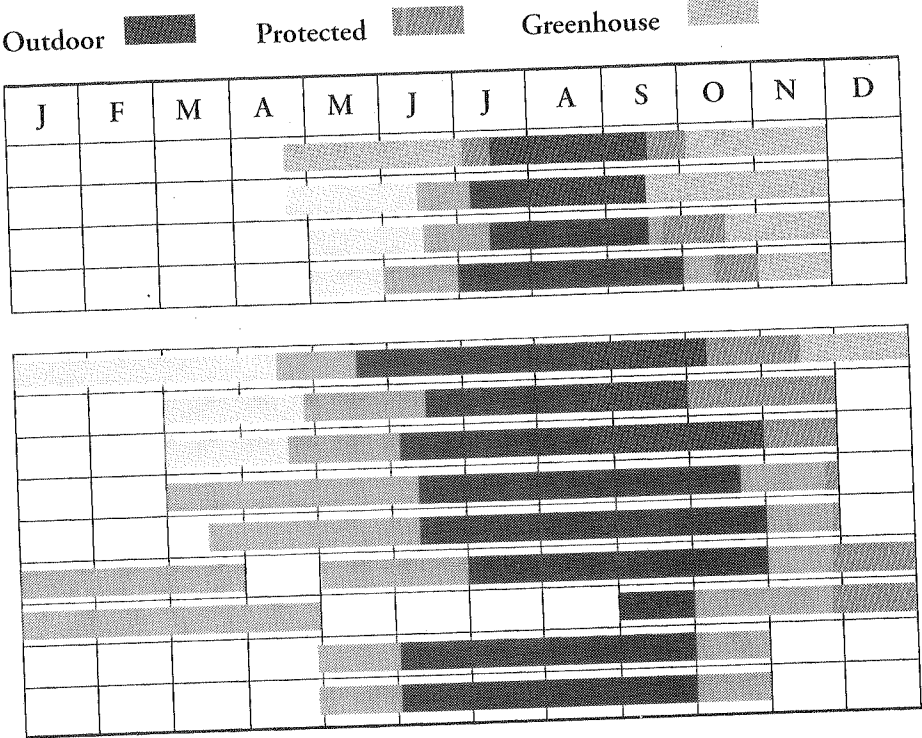
AVAILABILITY OF MAJOR CROPS FOR SALE



AVAILABILITY OF MINOR CROPS FOR SALE



SPECIALIZING IN SALAD CROPS



The "A" crops are the most potentially lucrative for the grower, but they are also the most expensive to produce. They need higher temperatures, requiring more heating costs and a more professional greenhouse, one that is taller and stronger for trellising.\* They also are not actually year-round crops, although they are long-season. Only the most specialized producers plan on harvesting before April and after November.

The "B" crops can be grown in simpler tunnel greenhouses at lower temperatures. Some, such as mâche, parsley, scallions, spinach, and carrots, can be grown as fall crops with no supplementary heat at all. They can be harvested all at once before real cold sets in, or over a good part of the winter by providing just enough heat to keep them from freezing. (See Chapter 23 for specific information on low-heat and no-heat winter production of these and other salad crops.) The decision depends on your market.

The most basic year-round greenhouse crop is lettuce. It is always in demand. Excellent varieties for winter production are available through the spe-

low temperatures and winter harvesting can be planned on a regular schedule (see page 260).

Production Size

This is a function of a number of other factors. How much land is available? How fertile is it? How many workers are involved? What kind of equipment is on hand? As I said earlier, I consider 5 acres of intensive production to be the upper limit. The decision about the size of a productive farm cannot be made in a vacuum. The relationship of size to all of the production and marketing factors must never be forgotten.

The market garden layout will obviously be determined by the lay of the land, but in addition there are some general suggestions that are applicable almost everywhere.

Subdivision

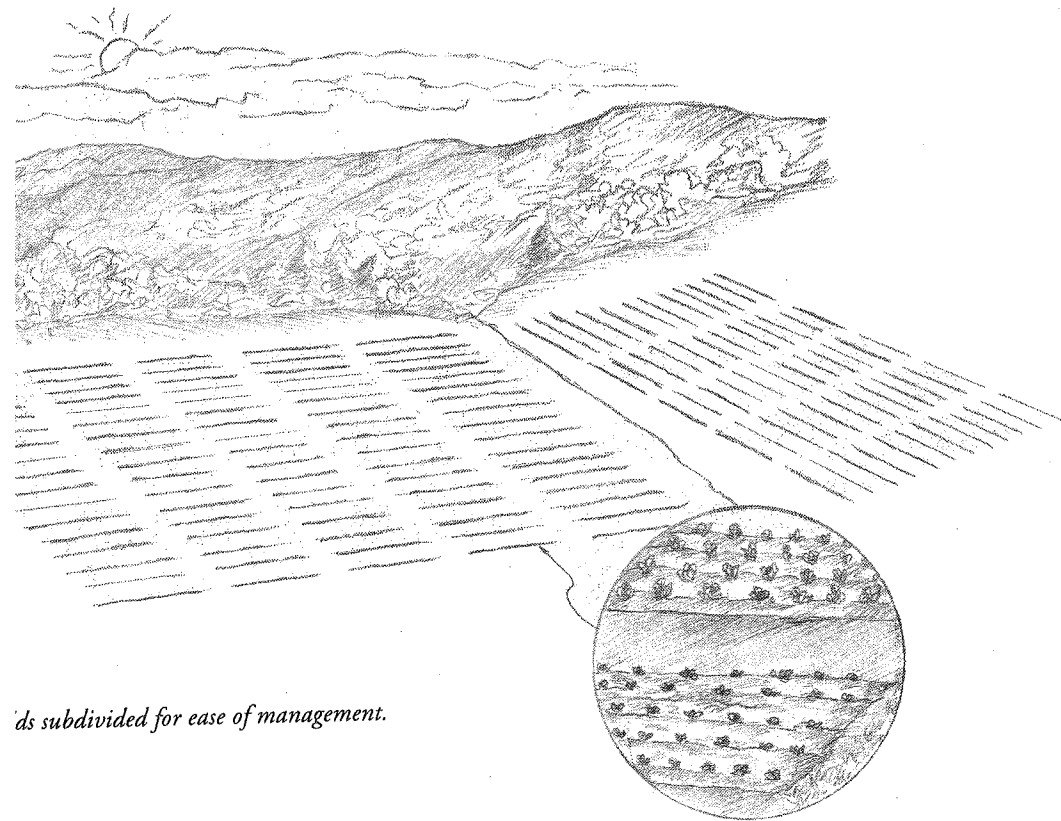
No matter what size the field, it should be subdivided. One-hundred-foot-long sections are the ideal size for the scale of machinery to be used. A 5-acre field, sectioned off, might look like this:

Ideally, the field will slope to the south. The rows run across the field. Each row is 100 feet long. The paths in between the sections, which allow for access and turning a walking tractor/tiller at the end of each row, are from 5 to 10 feet wide.

There are some solid reasons for subdividing. Ease of access, of calculating input and production information, and of general organization are just a few. The most important reason is management. Subdivision makes it easy to keep an eye on everything. Care is the key, and nothing must be neglected. Subdivision helps to get the grower and his attention to every part of the operation. The crop that could easily be forgotten in the middle of a large field is more likely to receive care in a smaller space. No matter what the shape of the growing area, it should somehow be divided into workable sections.

Layout and Crop Spacing

The divisions above must now be progressively subdivided again. Just as a country is easier to comprehend when it is divided into states, counties, and towns, a garden is more comprehensible as sections and strips and rows. Each section in



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section 100 feet long by either 42 inches or 60 inches wide. That creates 57 (42-inch) or 40 (60-inch) strips side by side in each section.

The choice between 42-inch or 60-inch strips depends upon the equipment available and the crops to be grown. In either case 12 inches of the strip is used as an access path for foot traffic, leaving a 30-inch-wide growing area from a 42-inch strip and a 48-inch-wide growing area from a 60-inch strip. Foot traffic should be confined to the access paths in order to avoid soil compaction in the growing area. Thinking in terms of strips helps to make the production system more flexible. Any strip can be planted after harvest to a succession crop or to a green manure independently of the rest of the section.\*

If you have a 26-inch-wide tiller on your walking tractor, or if you have access to a four-wheel tractor, the 60-inch strips will work best. They are also

best for those growing a wide range of crops, such as for a subscription market (see Chapter 20), since they are more efficient for the larger, more widely spaced crops. With the 26-inch tiller on a walking tractor, one pass down either side of the 48-inch-wide growing area will prepare the soil. For tractor tillage I recommend setting the wheels on 60-inch centers. A 48-inch or 60-inch tiller can then be used to till the strips. With a 48-inch tiller you will want to add cultivating teeth behind each wheel to control weeds in the wheelings. Or you can cultivate the paths with the 12-inch knife on the wheel hoe (see page 159) as you would if you were not using a tractor. I prefer to use a 60-inch tiller and then the wheelings are also tilled.

One useful hint: when tilling across a sloped field using either a walking or four-wheel tractor, start at the uphill edge of the area to be tilled. Then, as you till the second and subsequent passes, it will be the upper wheels that sink slightly in the softened soil, creating a leveling and slightly terraced effect to the field. If you start at the bottom edge this effect is reversed, and the tilt of the field is increased by the sinking wheels. It becomes harder to keep the tractor on line and to keep the field surface even.

The row spacings used for various crops in the 60-inch strips follow on pages 42 and 43, accompanied by drawings from a worm's-eye view

When growing and marketing specialty salads, I prefer the 42-inch strip width. It is also more comfortable for laying out a home garden, where the more commercially scaled 60-inch dimensions can be awkward. For an operation specializing in salads I recommend a walking tractor with a 30-inch tiller and the wheels set as widely as possible. You can then till the 30-inch-wide growing area in one pass. The 12-inch access paths are cultivated with the 12-inch knife on the wheel hoe.

I began using this spacing years ago for certain greenhouse crops and I soon adapted it to the field. I find it especially suitable when specializing in multicrop, fresh salad production where I am doing a lot of multiple harvest of low-growing crops and need to be able to quickly move across the field. It is easier to step across a 30-inch-wide growing area, and you can straddle it comfortably if you wish while harvesting, a feat that is physically impossible for most people when the growing area is 48 inches wide.

Suggested spacings for all the crops when grown in 42-inch strips are also shown on pages 42 and 43, with sample worm's-eye views.

The space-consuming crops are not as efficient in the 42-inch-wide strips, which is why I suggest this spacing is preferable for a salad cropping system.

ROW SPACING (on-center)	ROWS PER STRIP	SUGGESTED CROPS	WORM'S EYE VIEW
4"	6	Radish, spinach, mâche, green manure. These can be planted with a multiple-row seeder (see suggestions in Chapter 23).	
4"	10		
10"	3	Carrot, beet (fresh), celery, chard, garlic, lettuce, onion, parsley, spinach, celeriac, chicory, Chinese Cabbage, dandelion, endive, escarole, fennel, kohlrabi, leek, shallot, turnip	
12"	4		
16"	2	Beet (storage), kale, rutabaga, collards, salsify, parsnip	
18"	3		
42"	1	Beans, broccoli, Brussels sprouts, cabbage, cauliflower, corn, cucumber, melon, peas (low), pepper, potato, tomatoes (staked), eggplant, squash (summer)	
30"	2		

STRIP WIDTH	ROW SPACING (on-center)	ROWS PER STRIP	SUGGESTED CROPS	WORM'S EYE VIEW
42"	42"	1	Asparagus, peas (tall), tomatoes (unstaked), melon, squash (summer)	
60"	60"	1		
42"	126"	every third strip	Pumpkin, squash (winter). The unused strips on either side should be planted to a green manure.	
60"	120"	every other strip		

Getting Good Seed

So many factors are important in vegetable growing that there may be disagreement with the values I ascribe to some of them. But I doubt if anyone will dispute the importance of good seed. Without high-quality seed, all the other activities are moot.

The grower will first be concerned with specific named varieties (or *cultivars*, as they are also called). At the start I suggest sticking with tried-and-true, locally adapted varieties from a dependable regional supplier. After the first year or two, the grower should have enough experience about what works and what needs improvement to begin selecting from seed catalogs. With catalogs, it is mostly a case of learning to read between the lines. New seed varieties, no matter how highly praised, are always a risk. This is especially true with the commercial catalogs, which often select new cultivars for their ability to perform under conventional fertilizer/pesticide regimes. Organic growers will find, as I have, that the stable, older varieties often give more dependable results.



Some seed varieties, like some people, thrive best under specific conditions. That is not to say that you should avoid trying newly developed or hybrid varieties. Just never abandon a dependable old variety without being sure about the quality of its replacement. I have always found it rewarding to read specialty and foreign seed catalogs and then conduct trial plantings of promising varieties and even new crops. I have discovered a small but important number of my favorites this way. The number I trial is small because the seed companies are also testing and trialing varieties from many sources with far greater resources than I possess. For the most part their results are thorough and dependable. There always exists, however, the pleasure of a new discovery made on my own, and I heartily recommend the practice of seeking and trying.

Below are some criteria that you may want to consider when selecting varieties:

- *Eating Quality.* This is most important by far and includes the flavor, tenderness, and aroma of the vegetable, both raw and cooked.
- *Appearance.* Color, size, and shape are also important but are secondary to eating quality.
- *Pest and Disease Resistance.* This is useful where a problem exists; otherwise, choose a variety for its flavor and tenderness.
- *Days to Maturity.* This is obviously an important factor in planning early and succession crops.
- *Storage.* Suitability for long or short periods in storage.
- *Vigor.* This includes quick germination and quick growth.
- *Performance.* Does the variety have vigor under a wide variety of conditions?
- *Standability.* This describes noncracking tomatoes, nonsplitting cabbages, and so forth.
- *Ease of Harvest.* Carrots with strong tops are easier to pull, and beans held above the foliage are easier to pick.
- *Time of Harvest.* Various cultivars can extend your growing season.
- *Frost Resistance and Hardiness.* These are spring and fall concerns.
- *Day Length.* There are short-day varieties for winter greenhouse production, and so forth.
- *Ease of Cleaning.* Some leafy greens hold their leaves high to avoid soil splash.
- *Convenience.* This includes self-blanching cauliflower, nonstaking (determinate) tomatoes, and other convenient growers.
- *Ease of Preparation.* This means long as opposed to round beets, round as opposed to flat onions, and so forth.
- *Adaptability.* Many varieties winter over and provide early spring growth.

- *Nutrition.* Some varieties have higher levels of nutrients.
- *Marketability.* This includes specialty, ethnic, and gourmet varieties.

### Quantity

Quantity is the next concern. How much seed of each variety should be purchased? Planting techniques will affect this decision. If a majority of crops are transplanted as this book recommends, the grower will be able to get by with far fewer seeds than would be needed if plants were to be sown directly. Information on quantities of seed needed for direct-sown crops is given in most seed catalogs. At the start one might want to purchase extra seed just to be sure. A new seeder or a new setting could easily plant twice the seeds calculated until it is calibrated correctly. Nothing is as discouraging as running out of seed on a perfect spring planting day. The cost of seed for field crops is a small expense in most cases, and buying a little extra is good insurance for the grower.

If there are specific varieties or crops that become important to the farm's production, it is a good practice to purchase an insurance packet of those seeds from a second supplier. This is especially important with succession crops. Along with the first planting of the standard seeds, plant seeds from the insurance packet. If all goes well the extra seedlings won't be needed, but if the standard seeds don't perform well the grower will be covered and know where to order new stock. Be sure to set up credit accounts with favored seed firms so seeds can be ordered by phone quickly if there are any problems during the year.

It is wise to be covered in the same way when you are planning to use last year's seeds. Most of the time and for most varieties, year-old seeds that were stored properly (in cool, dry, and dark conditions) will work just fine. However, the savings are a false economy if a crop or a succession planting is lost because of seed failure. The grower should be sure to obtain each year's seeds as soon as possible. Never wait until the last minute. Early planting dates have a habit of sneaking up on you; before you realize it, spring is here. Whether you purchase seed from a mail-order catalog or from a local supplier will depend upon personal preference. What is necessary in either case is dependability. A grower needs consistent quality and up-to-date information. If the seed stock for a certain variety is poor one year, it is important that the supplier inform its customers of this fact. Smaller growers are often not privy to this information, so it always pays to ask.

I suggest a further precaution. After a few years' experience, a grower should

experiment with saving seed from open-pollinated varieties. *Open-pollinated* means that properly grown seeds will grow into plants that are true to type (unlike seeds saved from F<sub>1</sub> hybrids, which typically are either sterile “mules” or revert to one of the hybrid’s parent strains). For most crops the vigor and viability of seed grown under the careful cultural practices of this production system will far excel seeds that are purchased.

I make this recommendation for another reason, too. I doubt that the direction of present-day seed breeding, selection, and genetic manipulation is favorable to the producer of high-quality vegetables. Many older varieties are being abandoned or unnecessarily tinkered with. I now save seed from any open-pollinated varieties that I treasure for their eating qualities or excellent growth under my production methods. Seeds are the spark of the farm operation, and the more control the grower can exert, the more dependable the system will be.

When to Plant

The date of harvest depends on the date of planting. The span of time between the two may be longer or shorter depending on the effects of day length, weather, the aspect of the land, the crops grown, and many other growth-related factors. Although control is possible with protected cropping (tunnels and greenhouses), the earliest and latest unprotected outdoor crops are still important. They cost less to produce and they include many crops that are not usually grown with protection.

**Early and Late Planting.** The best information on your earliest and latest local planting dates will come from other growers, and not necessarily just the professionals. Good home gardeners are surprisingly astute about planting dates and other matters. More than once I have seen the experienced home gardener beat the pros to the earliest harvest. In truth, this is such a complex subject and one that can be influenced in so many ways that even the best growers are not doing all they could. Without a doubt, the early outdoor production potential of many farms can be improved by paying attention to windbreaks, exposure, soil color, and other microclimate modifications.

As a further refinement there are specific cultural factors to take into account. Sweet corn, for example, is an important crop for most market stands, and earliness is what brings in the customers. But the planting date of corn can be pushed back only so far because of the limits of temperature. Corn won’t germinate reliably or at all if the soil temperature is below 55°F. (13°C.). Yet

*\*Further information on succession planting of greenhouse lettuce can be found in Lettuce Under Glass, Grower Guide No. 21, published by Grower Books, 50 Doughty Street, London WC1N 2LP.*



overlooked. Pre-germinating corn seed or transplanting corn seedlings may be worth considering. Remember, we are not talking about the whole corn crop, rather just a few days’ worth to catch the earliest market. Corn can be transplanted quite successfully if it is grown in soil blocks (see Chapter 14).

**Succession and Greenhouse Planting.** If a grower wishes to harvest a crop such as lettuce progressively throughout the year, it may seem logical to plant every week to keep up the continuity of supply. The logic is only partially valid. There may indeed be 52 planting dates during the year, but they will not be at 7-day intervals. The season of the year affects plant growth because of light, temperature, day length, and so on. Planting dates must be adjusted accordingly. Although these dates will vary with the geographical region and lay of the land, certain general patterns can be used as a guide.

The maturity time for lettuce is doubled and tripled for plantings from September through February. The spacing of the planting dates must reflect that reality. In order to harvest lettuce every week from early November through April, Dutch research has determined that the following planting schedule is necessary.\* (Growers in the Southern Hemisphere can transpose all these dates by six months and obtain a reasonably close approximation of planting times.)

September 1 to 10	sow every 3½ days
September 10 to 18	sow every 2 days
September 18 to October 10	sow every 3½ days
October 10 to November 15	sow every 7 days
November 15 to December 15	sow every 10 days

Other trials have shown that seed-to-harvest times can be speeded up if lettuce transplants are grown under artificial lighting for the first three weeks.

Outdoor production has similar variables. In my own experience in Maine, lettuce sown in a cool greenhouse on March 1 and transplanted outside April 21 was ready for sale on about May 25, whereas lettuce sown April 1 in the same greenhouse and transplanted outside on May 1 matured on June 2. Remember, specific dates are only guidelines. I wish to stress the understanding of the concept and the general pattern. All growers need to compile information for the climate and conditions of their individual farms. In the long run trial and error will be the best teachers of specific planting dates. This is another area where keeping careful records can be so valuable to the success of your farm.

Despite all the best planning, climate is never consistent. Unusual extremes



MAJOR CROPS: AN OVERVIEW

	Quantity Consumed: Rank Order (USDA)	Greenhouse Production	Transplanted	Direct Seeded	Row Spacing (inches)	Plant Spacing (inches)
Paragus	17		*		60	24
Bean				*	30	4
Beet	14			*	18	3
Broccoli	12			*	30	24
sprouts	12		*		30	24
Cabbage	7		*		30	24
Carrot	9			*	12	1
Chiliflower	12		*		30	24
Celery	10	*	*		18	12
Chard	18	*		*	18	6
Corn	4			*	30	12
Cucumber	6	*		*	30	12
Garlic	20		*		12	4
Kale	7		*		18	12
Lettuce	3	*	*		12	12
Melon			*		60	24
ion, bulb	5		*		12	3
scallion	5	*		*	12	1
Parsley		*	*		12	6
Parsnip				*	18	3
Peas	11			*	60	2
Pepper	15		*		30	12
Potato	1			*	30	12
Pumpkin				*	120	24
Radish		*		*	4	2
Rutabaga	19			*	18	4
Spinach	13			*	12	3
b, summer	16			*	30	30
				*	120	24

is to grow more than one variety of any crop. The varieties would be chosen for their slightly different performance under similar growing conditions, thus allowing the grower to “blanket” the ideal maturity date. The dependability of the harvest is more assured by adding a comfortable flexibility that can absorb some of the shocks of climatic anomalies.

A Final Word

Another lesson I learned from the Nearings is the folly of working seven days a week. There is a strong temptation when starting out in farming, without the benefit of parents and grandparents having done much of the preliminary work years before, to try to do it all right now. Working nonstop day after day is not the best way to achieve that goal. You soon get stale and lose the sense of joy and pleasure that made farming seem so desirable in the first place. Scott and Helen taught me the importance of pursuing something different, at least one day out of the seven, no matter how much work needs to be done on the farm. Even in the midst of the spring rush it always turns out that one day of change allows much more to be accomplished on the other days. Rest and reflection not only heal the body but help provide insight into how to get more accomplished with less work in the future so the same bind won’t exist another year.